NOTE: C7 used on some sets then point "A" is connected to chassis. Switch 1 is on-off. Switch 2 is Ac-Do & Battery. Switch 2 shown for Ac-Do, I.F. 455 KC.

I.F. 455 KC

Switch 2A not used in some Models

TUBE FUNCTIONS
1A7GT - MIXER-OSCILLATOR
1N5GT - I.F. AMPLIFIER
1H5GT - 2ND DET-AVC-1ST A.F.
3Q5GT - OUTPUT
70L7GT-RECTIFIER

FOR CONVENTIONAL ALIGNMENT
SEE SPECIAL SECTION VOL. VIII.
TRIM OSC - 1550 KC, TRIM ANT - 1400 KC
PAD - 600 KC

CONDENSERS
C1 - .002 mfd. 600 volt
C2 - .05 mfd. 400 volt
C3 - .00005 mfd. mica
C4 - .05 mfd. 400 volt
C5 - .002 mfd. 600 volt
C6 & C17 - 40-40 mfd. 25 volt elect.
C7 - .25 mfd. 200 volt
C8 - .00025 mfd. mica
C9 - .01 mfd. 400 volt
C10 - .00025 mica
C11 - .01 mfd. 400 volt
C12 - .002 mfd. 600 volt
C13 - .01 mfd. 400 volt
C14 - .05 mfd. 400 volt
C15 - .02 mfd. 400 volt
C16 - 20-30 mfd. 150 volt elect.
C18 - .1 mfd. 200 volt
Gang Condenser
Trimmer Condenser

RESISTORS
R1 - 2,000,000 ohm ½ watt
R2 - 2,000,000 ohm ½ watt
R3 - 200,000 ohm ½ watt
R4 - 25,000 ohm ½ watt
R5 - 5,000,000 ohm ½ watt
R6 - 1,000,000 ohm Volume Control & Switch
R7 - 5,000,000 ohm ½ watt
R8 - 250,000 ohm ½ watt
R9 - 500,000 ohm ½ watt
R10 - 1,000 ohm ½ watt 10%
R11 - 30 ohm ½ watt 10%
R12 - 750 ohm ½ watt
R13 - 335 ohm 10 watt
R14 - 100,000 ohm ½ watt

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ALIGNMENT PROCEDURE

GENERAL DATA. The alignment of this receiver requires the use I. F. ALIGNMENT. With the gang condenser set at minimum, adjust the test oscillator to 456 KC and connect the output to the grid and 1720 KC and an output meter to be connected across the of the first detector tube (12A8GT) through a .05 or .1 mfd. compensating secondary of the output transformer. If possible, all denser. The ground on the test oscillator should be connected to the chassis ground. Align all three i.f. trimmers to peak or maximum sensitivity and the test oscillator output as low as possible to prevent the hum reading on the output meter.

CORRECT ALIGNMENT PROCEDURE. Remove the chassis from the cabinet and set on a bench taking care that no iron or other metal is near the loop. Do not make this setup on a metal bench. The intermediate frequency (i.f.) stages should be aligned properly as the first step. After the i.f. transformers have been properly adjusted and peaked, the broadcast band should be adjusted.

Voltages shown on the circuit diagram are from socket terminals to chassis base. In measuring voltages use a voltmeter having a resistance of at least 1000 ohms per volt. Allowances should be made for variations in line voltage.

Lack of sensitivity and poor tone quality may be due to any one or a combination of causes such as weak or defective tubes or speaker, open or grounded bias resistor, bypass condenser, etc. Never attempt to realign set until all other possible sources of trouble have been first thoroughly investigated and definitely proved not to be the cause.

NOTE: IT IS ABSOLUTELY NECESSARY THAT AN ACCURATELY CALIBRATED TEST OSCILLATOR WITH SOME TYPE OF OUTPUT MEASURING DEVICE BE USED WHEN ALIGNING THE RECEIVER AND THAT THE PROCEDURE BE CAREFULLY FOLLOWED, OTHERWISE THE RECEIVER WILL BE INSENSITIVE AND THE DIAL CALIBRATION WILL BE INCORRECT. THE TRIMMERS WILL BE REFERRED TO BY THEIR FUNCTION AS INDICATED ON THE PARTS DIAGRAM.
These are six tube superheterodyne receivers designed for use on 110-120 volt, 60 cycle, alternating current. The basic circuits of three models is the same and the following general instructions apply to all three listed models.

**INSTALLATION**

This receiver may be used with the Built-In antenna where receiving conditions are favorable. Where greater distances are required, or where receiving conditions are not satisfactory with the Built-In antenna, an outside antenna may be used. This outside antenna should be from 50 to 100 feet long and should be connected to the blue wire accessible at the back of the cabinet. This antenna should run in a straight line as possible and be kept clear of wires or other metal objects. A ground connection to a water pipe is essential for clear reception. The ground lead should be connected to the black wire extending from the rear of the chassis.

**DESCRIPTION**

The control on the left side of the cabinet is the volume control and ON and OFF switch used in the extreme left position. Next to the volume control is the tone control which controls the high frequency response. When turned to the left the full tone range of the program is reproduced. Turning the control to the right diminishes the higher frequency response. A position approximately one quarter turn from the left is satisfactory for most programs. On models 464, 469 and 471 a small switch near below the middle of the dial controls the bass and treble response. When turned to the left the lower frequency response is reduced. In this position reproduction of the lower frequencies is generally improved. When the switch is turned to the right the high frequency response is emphasized. This condition is usually more acceptable for normal programs. An operation switch is provided on models 465 and 471 for changing the functions of the receiver as noted on the control escutcheon. On the back of the chassis an antenna switch is provided for changing the connections of the receiver to the Built-In antenna or to the Outdoor antenna when one is connected.

**OPERATION**

With the line cord connected turn the volume control about one half turn to the right and allow about one half minute for proper heat. Select the desired station with the tuning control, varying the control until the tuning indicator produces the brightest shadow. Adjust the volume control to the desired level and the tone control for the most pleasing response. For best quality be certain the station is properly tuned in as indicated by the tuning indicator.

**AUTOMATIC PUSH BUTTON TUNING**

The push buttons are adjusted for selecting five stations as indicated by the call letters over the push buttons. To correct any of the push buttons, turn on the receiver as described above and depress the button corresponding to the desired station. The indicated waves disappear. To correct the indication use the tuning control for selecting the stations, depress the desired button. Directions for changing the push button station set up are attached to the bottom of the cabinet.
ALIGNMENT PROCEDURE:

Set the pointer to 1500 K. C. Connect the generator leads to the 1A7G grid and to the chassis thru a .1 Mfd. condenser. Adjust the i.f. trimmers for maximum output indication.

Connect the generator leads to the 1A7G grid and to the chassis thru a .1 Mfd. condenser. Set the signal generator at 1400 KC., and set the receiver pointer at 1400 KC. Adjust the BC. oscillator shunt trimmer for resonance.

Couple the generator loosely to the set and adjust the BC. loop antenna trimmer at 1400 KC. for maximum output.

NOTE: POWER AUTOMATICALLY TURNED "OFF" WHEN CABINET BACK PANEL IS REMOVED. (INTERLOCK SWITCH).

TECHNICAL INSTRUCTIONS:

A good output meter should be used in all alignment adjustments. This meter should be of the high resistance A.C. type, and is connected across the voice coil of the speaker, using the low voltage range of the meter. (0 to 1.5 or 2 volts). Use the lowest possible readings in order to minimize the A.V.C. effect.
ZEPHYR RADIO CO.

MODEL 23A5

5 TUBE 2 VOLT BATTERY OPERATED SKIP-BAND RECEIVER

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